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| 10/791,504 | 03/01/2004 | Dar-Ming Chiang | 250913-1140 | 2741 |
| 24504 7590 07/13/2007 THOMAS, KAYDEN, HORSTEMEYER & RISLEY, LLP 100 GALLERIA PARKWAY, NW STE 1750 ATLANTA, GA 30339-5948 | | | EXAMINER DESAI, ANISH P | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/791,504

Applicant(s)

CHIANG ET AL.

Examiner

Anish Desai

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 May 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 39-53 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 39-53 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed on 05/11/07 after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 05/11/07 has been entered.
2. Claims 39-53 are pending. Claims 1-38 are cancelled.
3. Claim objection to claim 39 is withdrawn.

Claim Rejections - 35 USC § 102/103

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 39 recites "VdF as first monomer, and HFP, CTFE, TFE, or combinations thereof as a second monomer." Thus, it is the examiner's position that any reference teaching a polymer obtained by copolymerizing VdF monomer and **either one** of the

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HFP, CTFE, TFE, or any combinations of HFP, CTFE, and TFE monomer will read on claim 39. Further claims 42-44, 46, and 49 recite "or less", thus it is the examiner's position that said recitation also includes zero as the lower limit, therefore any reference that does not disclose the amount of HFP (claim 42), CTFE (claim 43), TFE (claim 44), third monomer (claim 46), and second polymer (claim 49) will also read on the said claims. Further with respect to claim 39, the recitation "an electret coated along the porous profile" is interpreted as any reference disclosing electret coating composition as claimed that is applied to a porous substrate will read on "electret coated along the porous profile".

4. Claims 39, 40, and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chou et al. (US 2003/0054716A1) in view of Yamamoto et al. (US 4,560,737) substantially as set forth in 11/13/06 Office Action.

Chou teaches a method of making an electret that includes contacting a porous substrate that includes polymer with a composition that includes solvent capable of swelling the polymer, removing the solvent from the substrate, and contacting the substrate with water in manner sufficient to impart electret charge to the substrate (abstract). The porous substrate is a nonwoven fibrous web that include fibers selected from polyolefin, polystyrene etc. (0013). The electrets of Chou are suitable for use in variety of applications including filtering, electro-acoustic devices such as microphones, headphones etc. (0067). Additionally, Chou discloses that in one embodiment, contacting the substrate with the composition includes spraying. In other embodiments, contacting the substrate with the composition includes soaking (0010). Chou is silent as

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to teaching of electret having a first polymer copolymerizing from monomers having polyvinylidene fluoride as a first monomer, and hexafluoropropylene, chlorotrifluoro ethylene, tetrafluoro ethylene, or combinations thereof as a second monomer (claim 39) and electret is coated on the inner walls of the pores of the porous substrate (claim 53). However, Yamamoto discloses a piezoelectric polymeric material in the form of a sheet or film, which comprises polymers of vinylidene fluoride (VDF) as a principle component. The piezoelectric sheet or film of Yamamoto is formed into an electret (abstract). Further, the piezoelectric polymeric sheet or film of Yamamoto comprises copolymers of VDF and chlorotrifluoroethylene (CTFE) (Column 2, lines 20-21), which reads on an electret having a first polymer copolymerizing from monomers having VdF as a first monomer and HFP, CTFE, TFE, or combinations thereof as a second monomer as claimed in claim 39. Further Yamamoto teaches a spreading (coating) of a solution of copolymer (A) and vinylidene fluoride base resin on the substrate at Column 4, lines 21-22. Additionally, Yamamoto teaches that is an object of the present invention to provide an improved piezoelectric polymer material in the form of sheet or film, which exhibits higher moduli of piezoelectricity (column 1, lines 44-47). Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to spread (coat) the solution of copolymer (A) and vinylidene fluoride base resin on the porous substrate of Chou, motivated by the desire to improve the piezoelectric property of the electret of Chou.

With respect to claim 53, Chou as modified by Yamamoto is silent as to teaching of electret is coated on the inner walls of the pores of the porous substrate, however it is

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reasonable to presume that the electret of Chou as modified by Yamamoto necessarily has the electret coated on the inner walls of the pores of the porous substrate because like materials have like properties. Chou as modified by Yamamoto teaches a porous substrate with a coating of electret, which has the same composition as claimed by the applicant. Further since the substrate of Chou is porous, the coating would necessarily flow in the pores of the substrate. Note that reliance upon inherency is not improper even though rejection is based on Section 103 instead of Section 102. *In re Skoner*, et al. (CCPA) 186 USPQ 80.

5. Claims 39-44, 47, 50, 51, and 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto et al. (US 4,560,737) in view of Chou et al. (US 2003/0054716A1) substantially as set forth in 11/13/06 Office Action.

Yamamoto teaches a piezoelectric polymeric material in the form of a sheet or film, which comprises polymers of vinylidene fluoride (VDF) as a principle component. The piezoelectric sheet or film of Yamamoto is formed into an electret (abstract). Further, the piezoelectric polymeric sheet or film of Yamamoto comprises copolymers of VDF and chlorotrifluoroethylene (CTFE) (Column 2, lines 20-21), which reads on an electret having a first polymer copolymerizing from monomers having VdF as a first monomer and HFP, CTFE, TFE, or combinations thereof as a second monomer as claimed in claim 39. Further Yamamoto teaches a spreading (coating) of a solution of copolymer (A) and vinylidene fluoride base resin on the substrate at Column 4, lines 21-22.

Yamamoto is silent as to teaching of a porous substrate and an electret is coated on the porous substrate along the profile thereof. However, Chou teaches a method of making an electret that includes coating a porous substrate (abstract). Further Chou discloses a substrate formed of nonwoven fibrous web, which includes fibers selected from polyolefin, polystyrene etc. (0021). Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the nonwoven porous substrate of Chou in the invention of Yamamoto as a porous substrate because Chou provides necessary details to practice the invention of Yamamoto.

With respect to claims 41 and 43, the Example 1 of Yamamoto discloses 250 g of VDF monomer and 151 g of CTFE monomer that is subjected to polymerization. The chemical formulas of VDF and CTFE are $C_2H_2F_2$ and $CF_2=CFCl$ respectively. The molecular weight of VDF and CTFE are 64 g/mol and 116.47 g/mol respectively. Thus, the mole% of VDF in the mixture of VDF and CTFE is about 75 mole% and the mole% of CTFE in the mixture is about 25 mole%, which meets the claim limitations of claims 41 and 43 respectively. Regarding claims 42 and 44, Yamamoto is silent as to teaching of the content of HFP and TFE, which meets the claim limitation of claims 42 and 44. Regarding claim 47, although Yamamoto does not explicitly teach the content of fluorine element in the first polymer is between 60 and 78 wt%, it is examiner's position that as applied to claim 39, the teachings of Yamamoto either explicitly or implicitly teaches the content of the fluorine element in the first polymer to be between 60 and 76 wt%. Because, Yamamoto teaches the same composition (an electret having a first polymer copolymerized from VDF as a first monomer and CTFE as a second monomer) as

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claimed by the applicant. Thus, it is not seen that the copolymer of VDF and CTFE as taught by Yamamoto would not have the content of the fluorine element from 60 and 76 wt% as claimed.

With respect to claim 50, Yamamoto teaches in case of dissolving method, the copolymer (A) and the vinylidene fluoride base resin are put into a suitable polar solvent such as dimethylformamide (column 4, lines 17-20). Regarding claims 51 and 52, Yamamoto as modified by Chou teaches claimed invention except the initial surface potential of the electret as claimed in claim 51 and a surface potential of electret as claimed in claim 52. However, it is reasonable to presume that the piezoelectric sheet or film of Yamamoto as modified by Chou necessarily has the claimed initial surface potential as claimed in claim 51 and a surface potential as claimed in claim 52 because like material has like property. The electret composite of applicant comprises a porous substrate and an electret coated on the porous substrate wherein the electret has a first polymer copolymerized from VdF as a first monomer and HFP, CTFE, TFE, or combinations thereof as a second monomer. Further, the electret of the applicant is polarized by corona discharge. The piezoelectric sheet or film of Yamamoto as modified by Chou as applied to claim 39 also comprises a porous substrate with a piezoelectric sheet wherein the piezoelectric sheet comprises a copolymer of VDF and CTFE. Thus, the initial surface potential as claimed in claim 51 and a surface potential as claimed in claim 52 would have been present. Note that reliance upon inherency is not improper even though rejection is based on Section 103 instead of Section 102. *In re Skoner, et al.* (CCPA) 186 USPQ 80.

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6. Claims 45 and 46 are rejected under 35 U.S.C. 103(a) as obvious over Yamamoto et al. (US 4,560,737) in view of Chou et al. (US 2003/0054716A1) as applied to claim 39, and further in view of US 3,607,754 (hereinafter '754) substantially as set forth in 11/13/06 Office Action.

The invention of Yamamoto is previously disclosed. Yamamoto is silent as to teaching of the third monomer as claimed in claim 45 and the content of the third monomer in the first polymer is approximately 30 mole% or less as claimed in claim 46. However, '754 teaches an electret comprising a resin mixture of vinylidene fluoride resin and methyl methacrylate (abstract). Further '754 teaches that vinylidene fluoride resin is particularly interesting as a material for producing electret (column 1, lines 10-12) however the electret prepared by using vinylidene fluoride resin does not always sufficiently maintain electric charges (column 1, lines 27-29). Moreover, '754 discloses that a principal object of this invention is to provide an improved electret and a process of producing an electret having a high surface charge density and excellent maintenance of electric charges. With respect to claim 46, '754 is silent as to teaching of the mole% of methyl methacrylate, thus it reads on the content of the third monomer in the first polymer is approximately 30 mole% or less as claimed in claim 46. Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to add methyl methacrylate of '754 in the vinylidene fluoride polymer of Yamamoto, motivated by the desire to provide an electret having a high surface charge density and excellent maintenance of electric charges.

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7. Claims 48 and 49 are rejected under 35 U.S.C. 103(a) as obvious over Yamamoto et al. (US 4,560,737) in view of Chou et al. (US 2003/0054716A1) as applied to claim 39, and further in view of Allen et al. (US 5,610,455) (hereinafter '455) substantially as set forth in 11/13/06 Office Action.

The invention of Yamamoto is previously disclosed. Yamamoto is silent as to teaching of second polymer mixed with the first polymer as claimed in claim 48 and the content of the second polymer in the second polymer in the electret is approximately 60 wt% or less. However, '455 teach electret comprising syndiotactic vinyl aromatic polymer, for example syndiotactic polystyrene. These electrets have good charge retention at elevated temperature (abstract). Further '455 disclose that preferably the syndiotactic vinyl aromatic polymer comprises at least 30% by weight of the composition based on the total polymers in the blend. Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to add the syndiotactic polystyrene in the piezoelectric polymeric material of Yamamoto, motivated by the desire to provide electrets having good charge retention at elevated temperature.

Response to Arguments

8. Applicant's arguments filed 05/11/07 have been fully considered but they are not persuasive.

It is noted that Applicant's has continued to maintain same arguments that were previously presented to the Examiner in the 02/09/07 After Final amendment, which was entered (see Advisory Action dated 03/02/07). Specifically, with respect to art rejections based on Chou in view of Yamamoto, Applicant argues that none of the prior art

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references teach or suggest an electret coated on the substrate along the porous profile thereof. The Examiner respectfully disagrees. As previously stated the recitation "an electret coated along the porous profile" is interpreted as any reference disclosing electret coating composition as claimed that is applied to a porous substrate will read on "electret coated along the porous profile". The primary reference of Chou discloses that variety of methods can be used to treat the polymer substrate of his invention with the composition including e.g. soaking (i.e. impregnating and immersing), spraying, and combination thereof (0048). Thus, Chou's reference already discloses claimed feature of electret coated along the porous profile thereof as required by the claims.

Applicant further argues that there is no proper motivation to combine Yamamoto with Chou. According to Applicant, the primary reference of Chou et al. is complete and functional in itself, and there would be no motivation for one of ordinary skill in the art to introduce additional step of spraying solution of the copolymer A of Yamamoto on the substrate of Chou and stretching the sheet or film of the copolymer A to increase process complexity. The Examiner respectfully disagrees. The Examiner recognizes that the primary reference of Chou is functional in itself, however the proposed modification is provided for further enhancement. The science always seeks to improve. Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to spread (coat) the solution of copolymer (A) and vinylidene fluoride base resin on the porous substrate of Chou, motivated by the desired to improve the piezoelectric property of the electret of Chou.

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With respect to the art rejections based on Yamamoto in view of Chou, Applicant has essentially raised the same issues that were presented before the Examiner in the 02/09/07 After Final amendment, which was entered (see Advisory Action dated 03/02/07). Applicant argues that solution of the copolymer A and vinylidene fluoride base resin of Yamamoto would leak out through the pores of the porous substrate of Chou. Additionally, Applicant asserts that Yamamoto discloses resin composition sheet or film is stretched to an extent to enhance the piezoelectric modulus. According to Applicant when the resulting porous sheet or film is stretched the porous sheet or film may crack before reaching the desired stretching extent. The Examiner respectfully disagrees with Applicant because Applicant's arguments are based on his/her personal opinion without any factual evidence on the record. Accordingly, art rejections are maintained.

Conclusion

All claims are drawn to the same invention claimed in the application prior to the entry of the submission under 37 CFR 1.114 and could have been finally rejected on the grounds and art of record in the next Office action if they had been entered in the application prior to entry under 37 CFR 1.114. Accordingly, **THIS ACTION IS MADE FINAL** even though it is a first action after the filing of a request for continued examination and the submission under 37 CFR 1.114. See MPEP § 706.07(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within

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TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anish Desai whose telephone number is 571-272-6467. The examiner can normally be reached on Monday-Friday, 8:00AM-4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrel Morris can be reached on 571-272-1478. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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CHERYLA JUSKA
PRIMARY EXAMINER